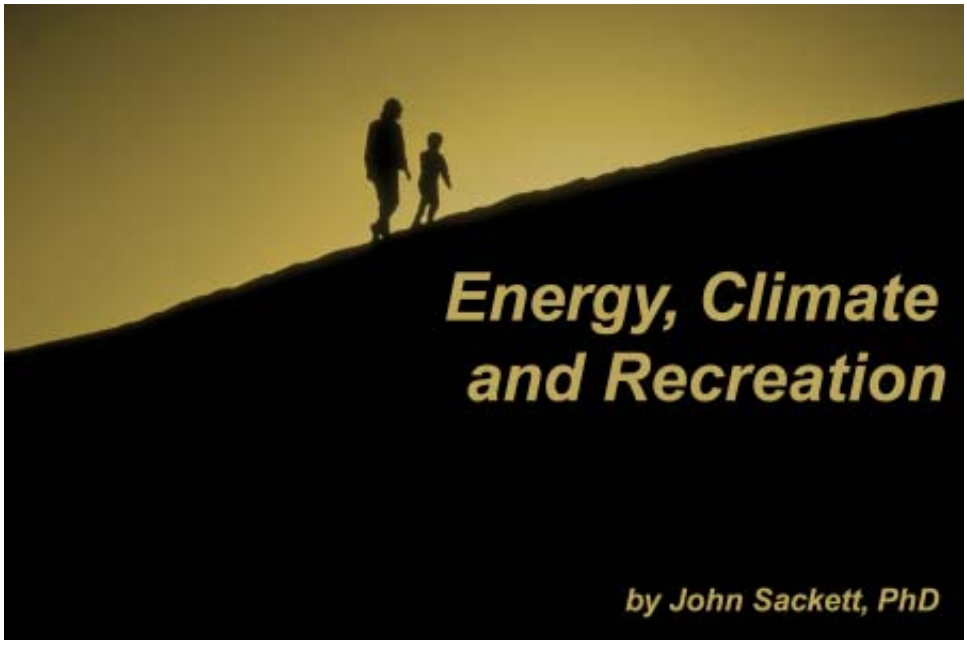

We live in a dynamic world. Changes in climate and standards of living will have a profound impact on how we live and play in the future. A common thread for these changes is energy. Abundant, affordable energy has fueled our amazing growth for the last century, and now the rest of the world is catching up. What does our future hold?

Our growth has been driven by solar energy. Only its use in different forms has changed as we have progressed. The discovery of fire allowed solar energy concentrated in wood to be used. Then it was coal, which drove the beginning of our industrial revolution. And then it was oil, which brought concentrated, stored energy from the sun to fuel our transportation needs. But the supply is finite and there is increasing evidence that its use is warming the earth.

Wind is another form of solar energy, but like sunlight, is not sufficiently concentrated to fuel the demands of an increasingly urbanized society. The most highly concentrated energy is nuclear, released either by fission (splitting heavy atoms), or fusion (combining light atoms). Fusion is the process of the sun itself. Increasingly, the most rapidly developing countries of the world are depending on nuclear power to fuel their futures. China recently announced its intent to place the largest order ever, thirty large nuclear plants, enough to provide electricity for thirty five million people. But even then, the plants will provide only about 4% of their electricity needs. There is much more energy growth ahead for a developing world, and much of it will be nuclear.

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What does this mean for our future? It is likely that we will move increasingly to a society even more dependent upon electricity. Electricity is an extremely versatile carrier of energy. Hybrid cars will likely increase in number and efficiency, increasing battery capacity while decreasing the size of their gasoline engines. Those gasoline engines may eventually disappear altogether. Hydrogen may also emerge as a transportation fuel if the problems of storage and distribution can be solved. But, electricity and hydrogen are only carriers of energy. Something else must produce it.

Electricity and hydrogen will be produced most commonly by the energy from coal and nuclear. Oil and natural gas will become increasing precious commodities for specialized use, a fact already being reflected in price. Wind and solar will find niche markets where population concentration is low. So what must we do? For coal, we must find ways of making it cleaner to burn. We must find ways of capturing and storing the carbon that is released and we must find ways of preventing the release of other components that pollute our air. For nuclear, which doesn't pollute the air, we must find ways of recycling the waste so that it may be destroyed rather that being buried in the ground for thousands of years. There are solutions to these challenges and succeeding with them is a global venture, simply because their impacts are global.

Idaho has a special role to play in this global challenge. The Idaho National Laboratory is leading the effort to develop advanced energy technologies, especially for nuclear power. Recently, young professionals from 34 countries spent six weeks in Idaho to learn from the world's experts about the challenges of nuclear power. The consensus was that for the world to have a sustainable future, nuclear power is an essential component in the energy mix. A growing reality, however, is that the talent to address these challenges is coming from places other than the United States. One measure is the fact that China and India alone graduated 850,000 engineers last year, compared to 70,000 for the U.S. The Idaho National Laboratory is working hard to meet the challenge, drawing young people into the vision of a sustainable energy future.

Each generation faces its own special challenge. For this generation, the challenge is energy. Available, clean, abundant energy fuels our very way of life, whether measured by the health of our economy, our freedom of transportation, our ability to pursue recreation or our ability to ensure our health. Abundant, affordable energy is also necessary to meet the increasing global crisis of lack of clean water, to provide food, and to avoid the inevitable conflicts between nations if energy is in increasingly short supply. Thankfully, these are challenges that this generation can meet.

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